

Operator Quiz Spring 2023 – What Do You Know about Activated Sludge Microbiology?

The following questions are designed for individuals/trainees pursuing certification as they prepare to take the ABC wastewater operator test. It is also designed for existing operators to test their knowledge. Each issue of *Clear Waters* will have more questions from a different process of wastewater treatment. Good luck!

- 1. Microbiology is a tool that can be used to help control the activated sludge process. Activated sludge is composed of many different types of microorganisms. This is known as a(n)**
 - a. controlled culture.
 - b. integrated culture.
 - c. mixed culture.
 - d. pure culture.
- 2. Representative samples for microbiological examination should be taken from an aeration tank. What type of samples should be collected for microscopic observation?**
 - a. 24-hour flow-weighted composite samples.
 - b. 24-hour time-weighted composite samples.
 - c. Grab samples.
 - d. Preserved samples.
- 3. For a wastewater treatment plant operated in conventional mode, at what location should a microbiological sample be taken?**
 - a. At the influent end of the aeration tank.
 - b. In the middle, between the influent and effluent ends of the aeration tank.
 - c. At the effluent end of the aeration tank.
 - d. At any location in the aeration tank, as long as it is the same location every day.
- 4. The two types of slides that should be prepared for observation include a wet mount for observing live micro-organisms and a stained dry slide for observing**
 - a. dead microorganisms.
 - b. *E. coli*.
 - c. filamentous organisms.
 - d. viruses.
- 5. The most common short filament in activated sludge plants associated with aeration tank foaming or frothing and excessive brown floating sludge in clarifiers is**
 - a. *Nocardia*.
 - b. *Sphaerotilus*.
 - c. *Thiothrix*.
 - d. Mastigophora.
- 6. Protozoa are usually single-cell protists often called “indicator organisms” as their presence indicates the amount of bacteria in activated sludge and degree of treatment. They include amoeba, Mastigophora (flagellates), free-swimming ciliates, stalked ciliates, and suctoria. The presence of which protozoa indicates a stable process that produces a low turbidity effluent?**
 - a. Amoeba.
 - b. Mastigophora.
 - c. Free-swimming ciliates.
 - d. Stalked ciliates.
- 7. Ideally, *Nocardia* and which other microorganism should never be seen in a healthy activated sludge system?**
 - a. Free-swimming ciliates.
 - b. Mastigophora.
 - c. Rotifers.
 - d. Suctoria.
- 8. Rotifers are multicellular animals with rotating cilia on the head and a forked tail. They consume enormous amounts of bacteria and can feed on solid particles. The presence of numerous rotifers indicates**
 - a. a young, activated sludge with a high food-to-mass (F/M) ratio and low mean cell residence time (MCRT).
 - b. a stable sludge producing a good quality effluent.
 - c. a sludge that has been impacted by toxicity.
 - d. an old, activated sludge with a high MCRT and associated with a turbid effluent.
- 9. Laboratory process data, process control guidelines, and flows should be plotted on graphs to show upward/downward trends. Comparing microscopic results with laboratory process data**
 - a. should show an exact correlation between results at all times.
 - b. is mandatory to meet regulatory requirements.
 - c. is a check to support interpretation of microscopic examination results.
 - d. is unnecessary.
- 10. How frequently should microscopic examination be conducted when a treatment plant is running poorly?**
 - a. Once or twice per day.
 - b. Every two days.
 - c. Twice per week.
 - d. Weekly.

Answers to the left.

For those who have questions concerning operator certification requirements and scheduling, please contact Carolyn Steinhauer at 315-422-7811 ext. 4, carolyn@nywea.org, or visit www.nywea.org.